Claims

1. An electric floor heating system capable of preventing low-temperature burn which system comprises an electric floor heating panel and a floor material placed thereon; wherein said floor material is formed by laminating integrally an upper material having a thickness (d) of from 0.01 to 12 mm and forming the floor surface, a heat diffusing material having a thickness (t) of from 30 to 1,000 μm and disposed below the upper material horizontally to the floor surface, and a lower material whose lower surface contacts the panel; and wherein when said panel is selected from those whose minimum value (p1) of the maximum power is 65 W/m^2 and maximum value (p2) of the maximum power is any of (1) to (12) below, said upper material thickness (d) and said heat diffusing material thickness (t) are set to fulfill relational expression (I):

$$t \geqq a \times d^2 + b \qquad (I)$$

into which coefficients a and b predetermined by the maximum value (p2) of the maximum power are introduced, such that said floor material is so constructed that with the floor surface blocked by a human body and heated by said panel selected, the contacting surface temperature of the human body is kept at 42 ℃ or below:

(1) when p2 is 140 W/m^2, a is 2.1 and b is 50;

(2) when p2 is 150 W/m^2, a is 2.9 and b is 71;

(3) when p2 is 160 W/m^2, a is 4.5 and b is 113;

(4) when p2 is 170 W/m^2, a is 7.6 and b is 163;

(5) when p2 is 180 W/m^2, a is 17.9 and b is 228;

(6) when p2 is 230 W/m^2, a is 69.4 and b is 553;

(7) when p2 is 240 W/m^2, a is 79.7 and b is 618;

(8) when p2 is 250 W/m^2, a is 90.0 and b is 683;

(9) when p2 is 260 W/m^2, a is 100.3 and b is 748;

(10) when p2 is 270 W/m^2, a is 110.6 and b is 813;

(11) when p2 is 280 W/m^2, a is 120.9 and b is 878; and

(12) when p2 is 290 W/m^2, a is 131.2 and b is 943.

2. The electric floor heating system according to claim 1 wherein said heat diffusing material is aluminum.

3. The electric floor heating system according to claim 1 or 2 wherein the total thickness of said floor material is from 2 to 40 mm.

4. An panel for an electric floor heating, formed by connecting foldably a predetermined number of electric heating boards to each other, wherein said panel is so designed as to cover 60 to 70 percent of a room where said panel is to be installed; the minimum value (p1) of the maximum power of said panel is 65 W/m^2 and the maximum value (p2) of the maximum power of said panel is limited depending on a floor material combined therewith; said floor material is formed by laminating integrally an upper material having a thickness (d) of from 0.01 to 12 mm and forming the floor surface, a heat

diffusing material having a thickness (t) of from 30 to 1,000 μm and disposed below said upper material horizontally to the floor surface, and a lower material disposed below said heat diffusing material; and when said upper material thickness (d) and said heat diffusing material thickness (t) fulfill any of the relations of (1) to (12) below, the maximum value (p2) of the maximum power is determined as follows:

(1) when $t \geqq 2.1 \times d^2+50$ is fulfilled, p2 is 140 W/m^2;

(2) when $t \geqq 2.9 \times d^2+71$ is fulfilled, p2 is 150 W/m^2;

(3) when $t \geqq 4.5 \times d^2+113$ is fulfilled, p2 is 160 W/m^2;

(4) when $t \geqq 7.6 \times d^2+163$ is fulfilled, p2 is 170 W/m^2;

(5) when $t \geqq 17.9 \times d^2+228$ is fulfilled, p2 is 180 W/m^2;

(6) when $t \geqq 69.4 \times d^2+553$ is fulfilled, p2 is 230 W/m^2;

(7) when $t \geqq 79.7 \times d^2+618$ is fulfilled, p2 is 240 W/m^2;

(8) when $t \geqq 90.0 \times d^2+683$ is fulfilled, p2 is 250 W/m^2;

(9) when $t \geqq 100.3 \times d^2+748$ is fulfilled, p2 is 260 W/m^2;

(10) when $t \geqq 110.6 \times d^2+813$ is fulfilled, p2 is 270 W/m^2;

(11) when $t \geqq 120.9 \times d^2+878$ is fulfilled, p2 is 280 W/m^2; and

(12) when $t \geqq 131.2 \times d^2+943$ is fulfilled, p2 is 290 W/m^2.

5. The panel for an electric floor heating according to claim 4 wherein said predetermined number of electric heating boards are foldably connected to the respective adjacent electric heating boards by

putting connecting belts through through-openings provided on edge side portions of the electric heating boards.

6. The panel for an electric floor heating according to claim 4 or 5 wherein the heating element of said electric heating board comprises a mesh-structured body formed by joining a non-conductive fiber and a conductive fiber at their intersections; electrodes joined on the both sides of said conductive fiber; an anchor part having a roughness on its surface and disposed on said electrodes; a fiber-reinforced prepreg sheet laminated on said anchor part and having a through-opening for a lead wire; and a resin film 70 laminated on said prepreg sheet and having a through-opening whose diameter is larger than said through-opening, formed into a molded body by a pressure-heating treatment, and said anchor part is molded on its portion corresponding to said through-opening of said prepreg sheet, with a resin.

7. The panel for an electric floor heating according to claim 4 which is composed of 2 to 10 electric heating boards.

8. The panel for an electric floor heating according to claim 4 wherein said heat diffusing material is aluminum.

9. A low-temperature burn preventing floor heating floor material, wherein said floor material is

formed by laminating integrally an upper material having a thickness (d) of from 0.01 to 12 mm and forming the floor surface, a heat diffusing material having a thickness (t) of from 30 to 1,000 μm and disposed below said upper material horizontally to the floor surface, and a lower material disposed below said heat diffusing material; said floor material is formed integrally with a panel whose minimum value (p1) of the maximum power is 65 w/m^2 and maximum value (p2) of the maximum power is any of those in (1) to (12) below; and said upper material thickness (d) and said heat diffusing material thickness (t) are determined so as to fulfill any of the relations (1) to (12) below corresponding to the maximum value (p2) of the maximum power:

(1) when p2 is 140 W/m^2, $t \geqq 2.1 \times d^2+50$;

(2) when p2 is 150 W/m^2, $t \geqq 2.9 \times d^2+71$;

(3) when p2 is 160 W/m^2, $t \geqq 4.5 \times d^2+113$;

(4) when p2 is 170 W/m^2, $t \geqq 7.6 \times d^2+163$;

(5) when p2 is 180 W/m^2, $t \geqq 17.9 \times d^2+228$;

(6) when p2 is 230 W/m^2, $t \geqq 69.4 \times d^2+553$;

(7) when p2 is 240 W/m^2, $t \geqq 79.7 \times d^2+618$;

(8) when p2 is 250 W/m^2, $t \geqq 90.0 \times d^2+683$;

(9) when p2 is 260 W/m^2, $t \geqq 100.3 \times d^2+748$;

(10) when p2 is 270 W/m^2, $t \geqq 110.6 \times d^2+813$;

(11) when p2 is 280 W/m^2, $t \geqq 120.9 \times d^2+878$; and

(12) when p2 is 290 W/m^2, $t \geqq 131.2 \times d^2+943$.

10. The floor heating floor material according

to claim 9 wherein said heat diffusing material is aluminum.

11. The floor heating floor material according to claim 9 or 10 wherein the total thickness of said floor material is from 2 to 40 mm.

12. An electric floor heating device which is the combination of an electric floor heating panel formed by connecting foldably a predetermined number of electric heating boards to each other and a floor material, wherein the minimum value (p1) of the maximum power of said panel is 65 W/m^2 and the maximum value (p2) of the maximum power of said panel is limited depending on a floor material combined therewith; said floor material is formed by laminating integrally an upper material having a thickness (d) of from 0.01 to 12 mm and forming the floor surface, a heat diffusing material having a thickness (t) of from 30 to 1,000 μ m and disposed below said upper material horizontally to the floor surface, and a lower material disposed below said heat diffusing material; and when said upper material thickness (d) and said heat diffusing material thickness (t) fulfill any of the relations of (1) to (12) below, the maximum value (p2) of the maximum power is determined as follows:

(1) when $t \geqq 2.1 \times d^2+50$ is fulfilled, p2 is 140 W/m^2;

(2) when $t \geqq 2.9 \times d^2+71$ is fulfilled, p2 is 150 W/m^2;

(3) when $t \geqq 4.5 \times d^2+113$ is fulfilled, p2 is 160 W/m^2;

(4) when $t \geqq 7.6 \times d^2+163$ is fulfilled, p2 is 170 W/m^2;

(5) when $t \geqq 17.9 \times d^2+228$ is fulfilled, p2 is 180 W/m^2;

(6) when $t \geqq 69.4 \times d^2+553$ is fulfilled, p2 is 230 W/m^2;

(7) when $t \geqq 79.7 \times d^2+618$ is fulfilled, p2 is 240 W/m^2;

(8) when $t \geqq 90.0 \times d^2+683$ is fulfilled, p2 is 250 W/m^2;

(9) when $t \geqq 100.3 \times d^2+748$ is fulfilled, p2 is 260 W/m^2;

(10) when $t \geqq 110.6 \times d^2+813$ is fulfilled, p2 is 270 W/m^2;

(11) when $t \geqq 120.9 \times d^2+878$ is fulfilled, p2 is 280 W/m^2; and

(12) when $t \geqq 131.2 \times d^2+943$ is fulfilled, p2 is 290 W/m^2.